Conference Proceedings

AGENDA 95

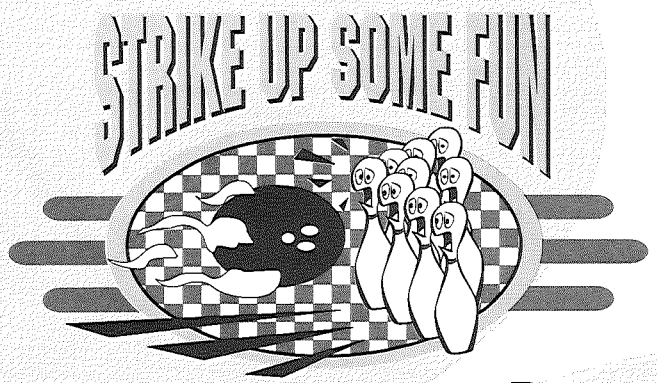
THE EXECUTIVE CONFERENCE SETTING DIRECTIONS FOR THE PC INDUSTRY

THE PHOENICIAN

SCOTTSDALE, ARIZONA

SEPTEMBER 18-20, 1994


STRIKE UP SOME FUN
THE GEMINI BOWLING PARTY
AGENDA 95



THE GEMINI BOWLING PARTY

AGENDA 95

Gemini Consulting Invites you to Strike Up some fun at Agenda 95!

Monday Night, September 19

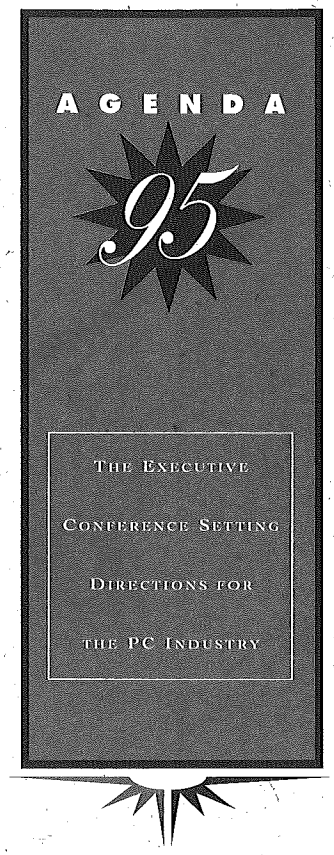
9:00 pm to Midnight

(after dinner on your own)

Just five minutes from the Phoenician!

InfoWorld Editorial Events

Conference Preceedings



THE PRECEDINGS

IS A THOUGHT-PROVOKER

FOR THE AGENDA 95 CONFERENCE

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Schedule of Events

SUNDAY
September 18

7:00 am

Golf Tournament & Continental Breakfast

Courtesy of Cunningham Communication, Inc.

8:00 am

Tennis Tournament & Continental Breakfast

Courtesy of Cunningham Communication, Inc.

11:00 am

Registration

12:00 pm

Early Arrivals' Luncheon

Courtesy of Cunningham Communication, Inc.

1:30 pm

Volleyball Tournament

Courtesy of Cunningham Communication, Inc.

6:30 pm

Welcome Reception & Dinner

Courtesy of Alex. Brown & Sons, Inc.

MONDAY
September 19

7:00 am

Registration & Continental Breakfast

8:00 am

General Sessions

STEWART ALSOP, Editor-in-Chief, InfoWorld Publishing Company
JAMES CANNAVINO, Senior VP, Corporate Strategy and Development, IBM Corporation
GORDON BRIDGE, President, AT&T EasyLink Services
MICHAEL NELSON, Ph.D., Director, White House Office of Science and Technology
DOUGLAS GLEN, Senior VP, Strategic Planning & Business Development, Mattel Inc.
MICHAEL WATTS, CEO, New Mediaware
MATTHEW MILLER, President, M-Squared Media and Technology
STEPHEN NACHTSHEIM, VP and General Manager, Mobile Computing Group, Intel Corporation

12:30 pm

Lunch

2:00 pm

General Sessions

ERIC BENHAMOU, President and CEO, 3Com Corporation
JOHN DOERR, Partner, Kleiner Perkins Caufield Byers
BRUCE RAVENEL, VP-Technology, Tele-Communications, Inc.
NATHAN MYHRVOLD, Senior VP, Advanced Technology, Microsoft Corporation
FERNAND SARRAT, General Manager, Networked Application Services Division, IBM Corporation
GERALD HELD, Senior VP, Interactive Multimedia and Document Automation, Oracle Corporation
MARTIN YUDKOVITZ, Senior VP of Strategic Development, NBC
PATTY STONESIFER, VP Consumer Division, Microsoft Corporation

4:30 pm

The Hindsight Awards

5:00 pm

Ice Cream Social

9:00 pm

Agenda Bowling Party

Courtesy of Gemini Consulting

TUESDAY
September 20

7:00 am

Continental Breakfast

8:00 am

General Sessions

STEPHEN CASE, President and CEO, America Online, Inc.
THOMAS MORGAN, Business Development Consultant
SCOTT KURNIT, Executive VP, Prodigy Services Company
MARC ANDREESSEN, VP of Technology and Co-founder, Mosaic Communications Corporation
BRUCE TOGNAZZINI, Distinguished Engineer, Human Factors Engineering, SunSoft, Inc.
DON PEPPERS, President, marketing 1:1
ERIC ZARAKOV, Program Manager, Advanced Technology Division, Apple Computer, Inc.
JOHN KERNAN, Chairman & CEO, The Lightspan Partnership, Inc.
ROBERT FRANKENBERG, President and CEO, Novell Inc.
WILLIAM GATES, Chairman and CEO, Microsoft Corporation

1:00 pm

Lunch

1:00 pm

Technology Demonstrations

6:30 pm

Closing Reception & Dinner

Courtesy of InfoWorld Publishing Company

Special Guest Speaker

MALCOM S. FORBES, Jr., President and CEO, Forbes Inc.

If you would like information about activities available for companions and kids, please call InfoWorld Editorial Events at (800) 633-4312.

Please note that there is no dinner hosted for Monday night. We will provide a restaurant guide in the conference program so that you can make reservations and plans with other attendees. Let us know if you need any suggestions.

Agenda 95

Tournaments

COURTESY OF CUNNINGHAM COMMUNICATION, INC.

Get in on the game. Sunday, September 18, marks the pre-conference sporting and social events to kick off Agenda 95. So come out and bring your family for a full day of fun in the sun.

Sign up for the golf tournament and tee off on the Phoenician's championship, USGA-approved golf course. Or play the tennis tournament on the Rebound Ace courts — the same surface used for the Australian Open. Or register for volleyball and show everyone your best spike.

But whatever sport you choose, make sure not to miss the Early Arrivals' Luncheon at the East Fountain at 12:00.

It's not too late to sign up! Call InfoWorld Editorial Events at (800) 633-4312.

SUNDAY SPORTS

September 18

7:00 am

Golf Tournament & Continental Breakfast
Golf Club House
(Shotgun start at 7:30 am)

8:00 am

Tennis Tournament & Continental Breakfast
The Tennis Garden
(Round Robin Format begins 9:00 am)

12:00 pm

Early Arrivals' Luncheon
East Fountain

1:30 pm

Volleyball Tournament
Croquet Lawn

A contentious student once asked the impressionist Paul Gauguin how to paint the perfect painting. Gauguin replied, "First become **perfect**, then paint naturally."

ANONYMOUS
Submitted by
KEN HAAS
President,
Intellicorp, Inc.

What the Digital Highway Will Look Like in 2020

STEWART ALSOP

Here is what I think the digital highway is going to look like in the year 2020, and why I think it is going to be such a major boon to society.

There are five components to the digital highway.

1) The first is what's loosely referred to today as the set-top box. There's a kind of magic that's become associated with this phrase "set-top box." In your mind, it looks like that thing that — if you have cable television — sits on top of your television set and gives you access to the cable system.

But there's no magic. The set-top box is going to be a computer. It's going to have a microprocessor. It's going to have memory. It's going to have an operating system. It's going to have all of the components of an existing desktop computer, or even portable computer, today. In fact, in order to implement most of the applications that people are talking about on the digital highway, it's going to have to be the equivalent of a relatively expensive computer today. The key features of the set-top box in 2020 are

- *It needs to be in the range of a 486SX computer with 8 megabytes of memory.*
- *It's going to have to have some form of fast storage — you're going to have to put stuff somewhere — that means that either it's going to have to have a hard disk in it, which most people don't include in their picture of the set-top box, or it's going to have to have a network that's fast enough to duplicate the function of a hard disk, and that means a network of at least the speeds of Ethernet. We're not talking about having CD-ROMs attached to the set-top box; CD-ROMs are inherently too slow to provide the kind of performance that real human beings need out of their television. It also means it's going to have an operating system with a hierarchical filing system, to manage that storage.*
- *You need to have a display with the resolution of Super VGA or HD-TV. You cannot have the television set that's sitting in your home today as the model for how you display stuff — you can't put text on that television screen and you can't represent information in a viable way.*

That system is expensive now — somewhere in the range of $2,500 to $3,500 in a retail store, given today's pricing. But we are talking about the year 2020, so over time, the price point for that type of functionality should come down (and, in fact, the functionality will likely go up, if the past is any indicator of the future).

2) The second component is a local area network for the home. The way many people think of the digital highway is that they think of themselves sitting in front of their television with their remote control flipping through channels. So they try to fit this whole notion of the

digital highway inside that notion of watching a television in their family room or their den. But one television in the den is the old paradigm for how we'd entertain ourselves. What we really need is a local area network inside the house that has many nodes on it. Then you have your interactive television in the den or the family room, a personal computer in the kitchen, a second interactive television in the master bedroom so that you don't have to fight with the kids over who gets to use the TV in the family room. (If you have more than one kid, you already know that they will each have their own interactive television set.) Then you have some kind of interactive audio-based system in the living room. Then you have your interactive telephones in the kitchen, the bedroom, the living room.

So you get to the point where you have multiple systems in the house. You don't want to have one wire coming in from your cable company going into one device in one place in your house and another cable coming in from the telephone company going to another device and not to all the others. The way that you solve that problem is by having a local area network in the house that distributes whatever is coming in from the outside to any device on the network. That's exactly the way it's organized in businesses, and it is inevitable in the home. As well, that network needs to be a fast network; it needs to run at least at Ethernet speeds, if not faster. If you're going to be delivering things like high-resolution video to any node in the house, you've got to have the equivalent of what most corporations now have installed, which is an Ethernet-speed or, even better, an ATM-speed network.

3) The third component of the digital highway is a digital switch in the house. This is a little box that sits in your basement or wherever wires come into the house. It's a digital switch that manages the interface to the digital highway. Coming into that switch, you'll have multiple wires.

This is where a lot of people trip up on the digital highway. They merge Bell Atlantic and TCI and they put all these companies together, and they end up with a concept that there's going to be one wire going into the house and that whoever owns that wire is going to control your view of the world. The truth is that we're going to have multiple points of access into the house. So you're going to have your cable, your coax cable coming from your cable television company; you're going to have your telephone lines, probably fiber right to the house by 2020. Those companies are not going to give up one of those lines in the process that we're going through of merging all these companies and financing the construction of this highway.

In fact, there may even be new entry points that we wouldn't have thought about previously. Many power companies, all of which have physical wires strung up on poles or in the ground going out to every house, are beginning to add the ability to communicate with their customers directly through a combination of fiber-optic cables strung on those very power poles and some kind of wireless transmission at the end points. And there's a whole other system that involves satellites, either in a direct, digital broadcast system like that being built by Hughes or even in an interactive two-way, low-orbit system like that proposed by Teledesic. So there may be as many as four or five entry points into the home coming in, and that digital switch will be the receiving point.

The interesting thing about the digital

switch is that it eliminates all of the issues about equal access to the digital highway, because it places control over access to the highway in the hands of the customer instead of in the hands of a cable company or a telephone company or some other corporate or even governmental entity. It means that the customer has the ability to control what they see coming in through these multiple sources as well as being able to put stuff back out over the network.

4) The fourth component of the digital highway is what I call the community network. This one is harder to talk about because I actually don't know what I'm talking about. When people talk about 500 channels, they're thinking in terms of the television or a cable system that has 33 channels or 45 channels or however many channels they're capable of offering. But a channel is a notion that's based on a one-way broadcast technology where you have a signal that is received on a particular channel and you turn to that and somebody is filling that channel up.

But the right paradigm for the digital highway — as even our esteemed Vice President has recognized — is the Internet. The transition you have to make is to not think of it as somebody stuffing material down a channel but lots of people offering lots of different things simultaneously. The digital highway is going to be a network or a network of networks, which is exactly what the Internet is. When you look at the architecture of the Internet or of the telephone system (which is also a large, switched network), you find that there are control points, or hubs, places where you concentrate the networks. On the Internet, the universities own and manage those control points. In the telephone system, the local operating companies own and manage those control points.

So the question that we have to ask is, "Who controls the hubs? Who controls the wires that manage, that transmit all of this stuff?" It's sort of the common carrier paradigm. That's a question that we as a society have to answer as we go along. We have to decide who we want to trust with the management of these systems. I've had the thought recently that our local government should be entrusted with this responsibility, in a kind of electronic parallel to the idea of a decentralized, democratic society. I happen to live in San Carlos, California, on the San Francisco Peninsula about 20 miles south of the city. San Carlos managed to use its cable television franchise, granted by the federal government, as leverage to get Tele-Communications Inc. (TCI), who is our cable provider, to actually wire the city's and the school district's building together with fiber-optic cabling — something the city couldn't afford to do itself. When this fiber-optic network is installed, I'll live in a city with a very high speed network among all the buildings owned by the city of San Carlos as well as the school system. So I had the notion that maybe the managers of our cities and towns should be the entity that we trust with managing our access to the digital highway.

5) The fifth component of the digital highway is the servers. The word "servers" is just a way of identifying this component. There's a lot of different words you could use to describe it, but this component is basically the applications — the things you do on the digital highway.

A lot of the vendors are working on video servers, which have the ability to deliver video to lots of people at the same time across the network. The technical

challenge is to do it in such a way that one person can start *Terminator 2* at 10:00 p.m. and the next person can start it at 10:01 p.m. and the next person can start it at 10:02 and that machine that's got that video on it can deliver that video in a stream that makes it look like you are watching it off of a single tape. That's a very difficult technical challenge.

But the real challenge is that we need to get to the point where anybody can provide video service. Say, for instance, that I happen to like the Marx Brothers. In fact, I'm so enthusiastic about the Marx Brothers that I've collected original prints of all their movies and television shows. And I've digitized those prints and put up a Marx Brothers server in my basement, which is plugged into the network, the digital highway. So I'll communicate to people out there on the network that I'm willing to rent these movies for a certain price. And, because I have a carefully cultivated reputation as a specialist in the Marx Brothers, they can get a better look at the Marx Brothers from me than they can from Time Warner or from some other large corporate entity, which really doesn't care about the Marx brothers and just has some grainy old prints from their vaults.

The ultimate technical challenge is to create a system in which it's not important how big you are or how small you are, but whether you have the ability to offer services that people are interested in and then finding a way to communicate that. In my mind, that's actually the ultimate in a free-market economy. It's kind of an electronic free-market economy.

What I've just described is a commercial server. It doesn't just have to be video on demand, as in the example of the Marx Brothers. It can be any service I can think of to offer for sale and that people are going to want to subscribe to, so you'll also have automated shopping, news agents, intelligent researchers, electronic town meetings (if you think of government as a kind of business), and so forth.

You can also have personal servers, which exist within your household and provide services that are entirely within the family group. For instance, you could have a personal financial server that does electronic funds transfer with your bank, pays your bills on a scheduled basis, and perhaps even watches commercial servers for good stock buys, given your resources and inclinations. You could have a family bulletin board. In my case, my siblings are spread out all over the country, and we have an incredibly difficult time keeping up with each other. So I could have a family bulletin board where we participate electronically in a kind of family chat and keep track of the gossip. You could have household voice mail. You can go on down the road of thinking of the things that you could do in your home local area network as an extension of the idea of the digital highway.

We are going to have a new kind of society, kind of a digital Walden Pond.

So that's it. That's my picture of our digital future. What it is is a really big local area network, which happens to

span 260 million people throughout our country. So the only issue is: How long is it going to take to get from here, where we are now, to there? I think it will take approximately 25 years — until the year 2020.

I personally will get there earlier. I already live in a relatively advanced household. I have three telephone lines. I have two cables (actually, I have one cable that's split into two when it gets into my house, but it ends up being the same thing, given how cable delivers an analog signal today). And I have one power line. Within the next month or so, I'll add another, digital telephone line for ISDN capability. Sometime in the next five years, I'm going to get a cable modem, so I can interact with TCI through my PC. Or they might supply me with a set-top box that can do the same thing through my TV. Eventually, I'm going to add the digital switch that I talked about before to moderate between my network card on ISDN, my cable modem, and my digital set-top box. By that time, maybe in 2000, I'll also buy a direct broadcast satellite receiver. And maybe in 2005, I'll buy a two-way, interactive transponder from Teledesic, the company financed by Bill Gates and Craig McCaw. During this time, I also have to install a local area network in my house. And I will have to replace all of the devices — my television, my telephones, maybe even my appliances, including my lights, my sprinkler controls, and my pool house. I might get there by the year 2010, but it's going to take another ten years for the rest of the country to catch up.

Somewhere along the line, Pacific Bell will actually run a piece of fiber-optic wire right into my house to replace all those copper wires, which will number four by the time I get ISDN installed. (They'll leave one of those copper pairs, though, to provide power to my phones in the case of emergency, since glass doesn't carry electricity like copper does.) There's been heated discussions in the telecom business about whether it's possible to deliver video over telephone wire and whether it's possible to leave the copper wires that go into your household as the form of transmission into your house on into the future. The cable guys are real smug because at least they have a wire installed that can handle much higher bandwidth. I don't think there's any doubt — you're going to have to replace the wires (first the copper ones and then the coax one) that come into your house at some point over the next 10 or 15 years in order to get the services that we're talking about, particularly if you're talking about delivering multiple services into this kind of network architecture.

When we get there, when we get out to the year 2015 or 2020, we are going to have a new kind of society, kind of a digital Walden Pond, where you have as much choice as you could possibly have in how you construct your life. You can choose to live like a hermit and cut yourself off from human contact. But you can also use the technology to participate more effectively and more fully in society. You can deal with the world at large in the same way that in fact, people used to deal with the world at large when there was no industrial society, no structure imposed by the machinery of our society. We can live according to our abilities in a system that is fundamentally designed to be open and universal.

Stewart Alsop is Editor-in-Chief of InfoWorld Publishing Company.

Adapted from address to Commonwealth Club of California, Santa Clara, California, January 19, 1994.

"The race for scale has already started, and if you don't become a part of the steamroller, you're destined to become a part of the road."

CHIP MORRIS
Submitted by
DAN EILERS
President & CEO,
Claris Corporation

The Economics of Online Services: The Squeeze Is On

THOMAS MORGAN

The Impending Battle between Online Services, Media Companies, and Network Operators

The Problem at Hand

The past year has seen an explosion in the growth of online services. America Online, the glamour stock of the industry, will end up in 1994 with a 300% growth rate. Prodigy, that white elephant of the '80s, is reportedly starting to show a profit. And a gaggle of new entrants such as Ziff Interchange, Apple eWorld, AT&T PersonaLink, and eventually Microsoft Marvel have, or will, enter the industry. A growing number of media organizations, including players such as *Time* magazine, *Sports Illustrated, CNN, ESPN, Parents* magazine, and a range of local newspapers, have struck deals with at least one of the major services. And recently entering the fray have been the cable companies and Bell Operating companies. These latter groups have focused on the inclusion of online services in the offerings of new interactive cable or digital telephone trials. In short, online is hot and represents to the '90s what PC's did for the '80s.

But all is not rosy on the horizon of this industry. Past industry service offerings have been based primarily on a PC-enthusiast marketplace and have been dominated by bulletin boards and chat rooms. Average consumer bills have ranged in the $12-to-$20 -per-month range, though some enthusiasts have regularly seen bills greater than $50 a month. And this is for a service that the average subscriber uses four to five hours per month. But while the profits of the major online services have improved dramatically, the economics of the third-party publishers has been anemic.

The economic foundation of existing online services has been the creation of low-cost services, with limited production value and even smaller content royalties. In fact, for bulletin boards and chat rooms, the content-creation process has actually been a profit center. Services charge consumers to post information, then services charge consumers to read the information. Most services hired freelance SYSOPS to manage the bulletin boards and chat rooms. These enthusiasts typically were fanatics in a given topic who would eagerly agree to a small compensation (typically 5% to 7.5% commission of the connect fee in their area) for the privilege of becoming the topical expert in their field. For these people the humorous advice of "keep your day job" was no joke.

But now the game is changing. Large media companies have discovered the world of interactive and are entering in droves. Media giants such as *Time, US News and World Report,* NBC, and ESPN

are all now present on one or more of the large online services. And it is the financial and media control requirements of these players that are creating the economic shift in the industry. Whereas a SYSOP is paid roughly 7.5% commission on their area usage, the branded media companies have been able to negotiate royalty percentages that are roughly double (15% to 20% appears to be the going rate). In addition, because these media organizations have marketing muscle through their existing media properties, they often get headhunting fees for promoting the service (a rate of $10 to $20 per acquired subscriber is a number often mentioned). But is this a good business for the large media organizations? A simple analysis of publicly available information reveals some interesting results.

The game is changing. Large media companies have discovered the world of interactive and are entering in droves.

Time magazine has admitted publicly that the Time Online area on America Online receives 70,000 visits per week. Since an average online session tends to be in the 15-minute range, it might be reasonable to assume that each of the visits to Time Online is 5 minutes. Thus, using 4.25 weeks per month, this service receives roughly 25,000 hours of connect time per month. Seems reasonably robust. But assuming AOL compensates all service providers based on the $3.50 per hour rate, and if *Time* had a 20% royalty agreement, then the monthly compensation to *Time* for Time Online would be $17,500 per month or $210,000 per year. And even if the analysis is off by 100% the point to be made is that for a major media organization this is not, at present, a major new revenue source.

The point here is not to pick on *Time*. In fact, especially given available resources, their product is quite outstanding. The message is that the economic model of online services is not sufficiently robust at this time to profitably support large media companies.

Now consider the inclusion of cable or local phone companies. At present all online services take advantage of free local calling for consumers. The networks that the services use have hundreds of local nodes that are designed to let people dial into the network without incurring local message units or toll charges. Add to this picture a cable company that is accustomed to extracting at least 50% of the subscription fee for a premium cable channel. When an online service goes onto these new distribution channels, the traditional economic model is severely taxed. Kind of reminds one of that old Mel Brooks business training film *The Producers*, 80% here, 50% there, Springtime...

So what are the answers? The immediate reaction of some of the media organizations is to develop their own online service, or to contract with a service provider that is willing to develop a relationship that is more palatable to the publisher. Newspapers appear to be pioneering in this area, the COX and

Times Mirror relationship with Prodigy providing the best example. Supposedly those contractual relationships involve more of a 50 - 50 split of revenue for the local publishing product. A service like Access Atlanta, while operating on the Prodigy computers, is controlled and marketed by COX. Evidently the thinking is that by working more on a private label basis with the newspaper, a national service packager like Prodigy can develop a marketing partner that can build subscriptions to the national service. This approach resembles the traditional relationship between the three television networks and local affiliates..

A second approach is one that will soon be tried by some of the new entrants into the online world. Services like Ziff Davis Interchange or the unannounced Microsoft Marvel appear to be taking more of a platform approach. In this environment a publisher could charge a flat subscription fee to a specialized service and keep all, or at least most, of that fee. The service platform operator would charge usage fees and would keep varying amounts of those fees. On a platform like Interchange there could be a wide selection of general purpose or targeted vertical market services to choose from. Often the analogy of a magazine rack is used for this concept. These models work well for both the publishers and the service operators because they focus on the value that each brings to the party. But, in the consumer market especially, these models can get expensive. Below is a case in point.

The average online member presently uses roughly 4 to 5 hours of online time per month. An addicted user can easily rack up 10 to 20 hours per month or more (keep in mind that the average household television is on 4 to 5 hours a day!). With the upgrading of the content on these services it is easy to argue that connect time averages will be increasing. Suppose a consumer subscribes to three of these electronic editions at an average price of $5 per month and uses each of them 3 hours for a total of 9 hours a month. Depending on how the minimum monthly fee is structured (e.g., like the AOL plan of 5 hours for $9.95), those 9 hours could easily cost in the $20 to $30 range. Add on the $15 of subscription fees, and the monthly online bill has zoomed past the cable bill. In the professional or corporate market this price point might not be that difficult, but in the consumer market it is a major issue. Compare 9 hours of use of three services for $45 to unlimited use of 50 to 100 channels of broadcast at $30 to $35. Which do you think they would choose?

If the online services industry is going to play a role it is going to have to learn from its television brethren to produce a product and economic model that is acceptable.

Now admittedly that is not a fair comparison. An interactive service is a participatory environment that is intellectually stimulating and very informative. But ask yourself the hard question, Does the average consumer really care? Does

interactivity really buy the average consumer that much? Obviously that is the crux of the mass market interactive debate. Can we build services that are compelling to the consumer and can we deliver them at the correct price? The cable industry is betting on entertainment on demand. That concept is primarily time shifting of existing entertainment properties. If the online services industry is going to play a role it is going to have to learn from its television brethren to produce a product and economic model that is acceptable.

The answers are not easy or immediate, but there are a few items that clearly are needed if we are going to succeed:

1) Better economic models for content providers. We need a lower cost structure. We have to be able to turn off the clock.

2) More customers. Even a 15% model will work if there are tens of millions of customers.

3) More revenue sources. We have to figure out how to successfully incorporate advertising and transactions into the equation of an on-demand medium.

4) Better applications, better content. Chat rooms and bulletin boards by themselves will not carry the day in the mass market.

5) And yes, standards! If content developers are going to be profitable they are going to have to reach large audiences. Having to rebuild services to comply with a diversity of proprietary protocols will not work.

The future of interactive services will be bright if we are able to solve some of the fundamental business issues required to make it a mass medium.

Thomas Morgan is a Business Development Consultant.

Notes From LA

HEIDI SINCLAIR

So you want to know where computing will fit on this whole information highway thing. Will computing be a big-time player, or will it be television or telecommunications, or whatever?

From where I sit, computing will be big, real big. This summer I moved from Silicon Valley to Los Angeles (Brentwood to be specific — but that is another story) and suddenly I'm hip. I lived and worked in Silicon Valley and in Boston — the hotbeds of technology — and I was never hip. No one wanted to talk about technology, even in technology circles. I could count the seconds between my answer to "What do you do?" and the state of eyes glazing over, a drink suddenly empty and an apologetic "Excuse me." And I worked in the glamorous software business.

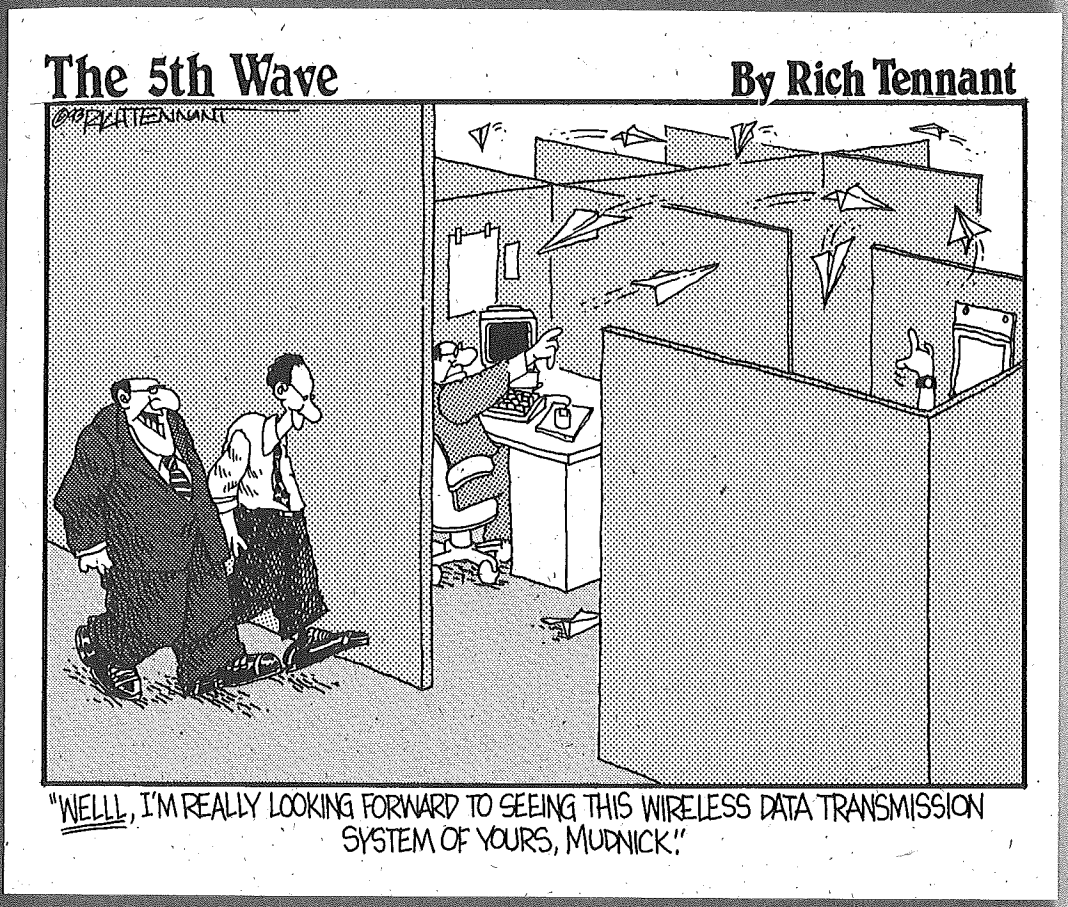
Within weeks of arriving in L.A., I found myself on the A list: meeting with the city's business elite, hanging out with the mayor, lunching with the L.A. Rams, celebs stopping by my table at Spagos and Mezzaluna (to check out what I'm doing on my laptop). Hollywood is hot on technology. Very hot. My neighbor the film producer is flying up to Redmond this week ("Microsoft pays well for content"). He wants me to introduce him to Intel. My other neighbor is a TV producer (and Angela Lansbury's son) — he's asked for a complete briefing on the technology industry. The neighborhood's beating a track to our door to get the inside track on technology.

So the arbiters of style, the people that set the trends for the world, seem to believe that something big is happening on computers, very big. Yeah, we all still live in cars on the 405 — an information highway paved with cellular phones and cellular faxes. And I haven't heard of a home screening room being built around a computer. Yet. But if Hollywood thinks it is hot, it will become hot.

As for me, how does it feel to finally be hip? Cool, very cool. But I gotta go — my agent's on the other line.

P.S. After a few weeks of living in la la land, I think the greatest technology invention of all time would be an automatic chauffeur–autopilot for your car, so you can talk on the phone, receive faxes, drink a latte, and put on your makeup without missing a beat. This is not rocket science. We have the technology — let's just get the price points down to make it part of a dealer option package, OK?

Heidi Sinclair is Senior Vice President and Managing Director, Interactive and Entertainment, Burson-Marsteller.



Illustrated by
RICH TENNANT

The Information Highway's Ultimate Achievement: More Time for Golf

PHILIPPE KAHN

I'm about to commit the ultimate blasphemy among the true believers in cyberspace. I'm going to suggest that we are not entering the promised land by recruiting millions of new enlistees to the Network. Despite the power of this medium, it is not to the greater good when armies of our fellow citizens spend their scarce leisure time staring at the cold glare of a computer screen.

The true potential of the information highway lies in just the opposite direction. It resides in turning the highway into a truly useful medium that will make us more productive, allowing us to be cyber-explorers, and not just correspondents. Rather than chaining us to the computer, this is a technology that could free us from repetitive tasks, giving us time to play more golf, climb more mountains, pick more roses, catch more fish.

- *In business, the information highway has the potential, at least, to let managers and entrepreneurs respond more quickly to change.*
- *Politically, the highway is about assuring the free circulation of ideas. There are few borders in cyberspace, and no customs agents checking baggage.*
- *Personally, the information highway can help us cultivate and maintain personal relationships.*

In all three cases, the very soul of the information highway is about learning. But too often, we forget that there are three types of learners: audio, visual and kinetic. As compelling as email is, it is no substitute for person-to-person interaction. By freeing our time and broadening our acquaintances, the biggest advantage of this technology may ultimately be in *more* thoughtful discussions over meals, political arguments at the coffee house, and chess games with the accompaniment of a good glass of wine.

I don't want to play down the advantages of the information highway as a first-class communications medium. I got to know those virtues firsthand during the 1989 Loma Prieta earthquake. Borland's headquarters are only five miles from the epicenter, and we lost an entire building and literally had to evacuate our computers to the parking lot. While all this hell was breaking loose, I was at a conference in Sydney, Australia, frustrated that I couldn't be there, but needing to stay in touch. As I was glued to CNN, I discovered that while voice communications were impossible, I could still communicate by email. Over the subsequent months, the Net really came through, allowing many of our employees to telecommute while the main highway into Scotts Valley underwent repairs.

But here's the problem. If you define the information highway strictly as a communications medium, you wind up with just another incarnation of the ham radio, or the telephone system, or even a high-speed version of the postal service. Let us not forget that what is now derisively called "snail mail" served our grandparents just fine and hosted some of the more eloquent examples of the written word. I am extremely wary of a society where everyone gets stuck in front of a screen with a mouse and keyboard, where person-to-person interaction boils down to people talking through computers two offices apart.

There is a broader use for the information highway that we have only just begun to consider. It lies in the potential of converting the hundreds of kilobytes of text that can be downloaded off the Net into an intelligent format that can be browsed quickly and stored conveniently. The genesis of this concept resides in the software agent — an intelligent chunk of code that acts as a personal butler, running through the network gathering useful pieces of information. But agents are only the first step, because when their work is over, you end up with the electronic equivalent of a canvas sack bulging with documents. Some of this material is of real value. Others amount to junk mail.

What is needed is a new set of software tools that can transform this mishmash into useful information. I am referring here to a database, but not a conventional one. A conventional database has a known structure. A bank manager can query which customers bounced the most checks because the fields containing customer information and overdraft charges are an expected part of the structure.

But if you want to derive similar benefits from information gathered on the Network, you've got to change the metaphor — because you will never know the exact nature or structure of the information with which you are going to interact. In other words, we have arrived at a place very near to the world described by my friend Douglas Adams in *The Hitchhiker's Guide to the Galaxy*. We can access from the far corners of the world in just a second. But we can't predict exactly what we're going to end up doing with what we find along the way.

As people shut themselves indoors with their VCRs, CDs, and modem connections, something precious is being lost.

So the challenge is to build applications that adapt themselves automatically to the environment. They will have to be more flexible in the way they store information, and in how they permit people to retrieve it. There is a parallel here in the move toward "slimware" — simple, elegantly designed applications that can put a vast universe of personal information at your fingertips. Such applications have the potential, at least, of sparking creative thought and freeing us to play more golf.

With all the brouhaha surrounding the information highway, a lot of people

are focusing a lot of energy on the infrastructure, rather than on where the highway is headed. Consider the more traditional highway, the one you drive on. When is the last time you discussed the graceful sweep of the overpasses or the beauty of the oleanders in bloom along the center divider? Only the occasional pothole or closed on-ramp reminds us that highways actually have an infrastructure. The paradox is that the information highway will only be real when no one is talking about it anymore, when it becomes an integral part of what we do. Our job as a software industry is to build the cars, trucks, and school buses that can take people along the highway to where they want to go — conveniently and quickly.

As we embark on connecting masses of computer power worldwide — which is ultimately what the information highway is — and as we introduce this computer power to the sanctity of our homes, we should at least be conscious of the challenges we are creating to our society. We must avoid playing the role of the Sorcerer's Apprentice, unleashing a technology before we understand its implications. As our children and grandchildren come of age, let's make certain that the technology we build today is really at their service —, and not the other way around.

Philippe Kahn is President, Chairman, and CEO of Borland International.

"Ever notice that about the time you think you're going to graduate from the school of experience, somebody thinks up a new course?"

BEN HOLDEN
Submitted by
BLANCHE MCDADE
Conference Registrar,
InfoWorld Publishing Company

The Crucible of Radical Capitalism

BILL FREZZA

How the Information Revolution will transform the politics of power

Over the centuries technological innovations have triggered significant discontinuities in the range and means with which power could be exercised over a body politic. Gunpowder, the printing press, the railroads, steamships, television — all of these have had a profound effect on both the nation state and our modes of economic organization. We are fast approaching such a discontinuity, this one engendered by the uncontrolled growth of information technologies. At an accelerating pace the most innovative, productive, and important pieces of our economy are moving both through and into cyberspace. In less than a generation the "net" could become home to the bulk of our significant economic activity — the common marketplace of choice, our place of work, our refuge for leisure, our very medium of exchange. This will have a profound impact on the balance of power among nations, corporations, and individuals.

The power of the state in the twentieth century was bounded by its ability to lay claim to the industrial production of its people. It is not coal or oil or steel, however, that will form the foundation of twenty-first-century economies. It is information — in all the diverse and exploding manifestations that human ingenuity can create, from software to manufacturing specifications to crop data to medical imagery to multimedia entertainment. And information, by its essential nature, is difficult to restrain, command, tax, ignore, or suppress. It will soon be impossible for sovereigns to monitor and manipulate the streams of data that will become the substance of our commerce. While the state has always had the power to seize a coal mine or an oil well or a paycheck, most often in the name of "the public good," no government can seize an idea. It is a lamentable fact that the owner of a threatened coal mine cannot spirit his property into the night. But an idea? An idea can cross the world in milliseconds.

Most importantly, this information economy will incorporate one critical difference from its predecessors. Advances in the sister technologies of encryption and digital authentication will move this new economic frontier well beyond the reach of any sovereign power. For the first time in history it will be possible for any two people in any two places on earth to transact business that is absolutely confidential and completely verifiable. Commercial correspondence, contracts, even the delivery of the digital product itself will be scrambled with codes unbreakable by the most motivated and well-equipped authorities.

Accounts will be settled in a new medium of exchange known as anonymous digital cash, a technology that allows for completely reliable and verifiable funds transfer without the inconvenience of leaving a traceable record in the hands of a third party. Digital cash can be exchanged for gold or the national currency of your choice in competing tax havens throughout the world, or more importantly, can be spent to procure other goods and services on the net.

Imagine the possibilities. Practitioners of laissez-faire capitalism throughout the developed and developing world won't have to struggle to persuade their fellow men to re-architect the basic relationship between state and citizen. They will be able to go off and do it with or without them. This exodus of the productive will ultimately touch off a revolution that will result in the practical separation of commerce and state, a radical, outrageous, earth-shaking development that will be a tremendous threat to the existing social order and will challenge the moral underpinnings of all governments as they are now conceived.

The process has already started. The command-and-control economies of the tottering socialist empires fell first, their despots deposed not by bombs or bullets but by fax machines, telephones, and televisions. Relatively simple technology toppled the bankrupt heirs of Karl Marx. A more sophisticated information infrastructure will be required to disarm the unconstrained majoritarians that currently administer world governments for the benefit of cash-bearing corporations and vote-bearing entitlement seekers. Once the new digital infrastructure reaches critical mass it will kick off a worldwide game of "catch us if you can." When the combined might of nations tries to chase society's producers of goods and services down the information superhighway, making claims on the fruits of their labor, they will simply disappear into the ether.

How will future radical capitalists manage this vanishing act? The answer reveals the key to understanding the frantic attempt that the Clinton administration is making to control encryption technology. Think about the arguments advanced in support of the so-called Clipper chip standard that requires users of encryption technology to escrow keys with the government. Is Clinton really trying to protect us from terrorists, drug pushers, and child pornographers? Is the widespread availability of private encryption really that serious a threat to the CIA and the FBI? Nonsense. Real crooks won't use Clipper. They will choose one of the many readily available and virtually unbreakable private alternatives, one without a built-in back door. The federal agency in gravest peril, the organization that will ultimately be rendered impotent when net-citizens assert their natural right to privacy, is the IRS.

For the first time in history it will be possible for any two people in any two places on earth to transact business that is absolutely confidential and completely verifiable.

During the acrimonious debate that preceded ratification of the constitution, the anti-federalists won a last-ditch effort to attach a Bill of Rights that, among other things, protected all citizens from forced self-incrimination. While the Fifth Amendment continues to shield criminal activity, this basic protection lasted only 124 years before it was breached in the economic realm. The Sixteenth Amendment, passed in 1913 to empower the federal government to collect a tax on incomes, has since fueled the growth of a bloated leviathan, unleashing unchecked inquisitorial powers that are used to pry into the most intimate details of our lives. Not too long after our incomes follow our economic activity into cyberspace this inquisition is going to end.

Encryption is to the Information Revolution what the Atlantic Ocean was to the American Revolution. It will render tax authorities as impotent in projecting their power as the ocean crossing did to King George.

And how will this development effect our forms of economic cooperation? Will multinational mega-corporations move in and take the place of governments? Will greedy, insensitive monopolists, unchecked by the enlightened watchdogs of the public good, hold unbroken sway over our lives? Nonsense. Look around you. Is total employment among the Fortune 500 growing or shrinking? Where do you think downsizing and outsourcing will ultimately lead?

Most mega-corporations owe their size not to their efficiency and flexibility but to their ability to curry political favor. If you are in doubt ask yourself why the biggest political contributors are the most heavily regulated companies. What will happen when the redistributive powers of government are rendered impotent by the inability to pick our digital pockets? When hungry competitors, local and international, can no longer be kept out of markets by a stifling web of regulations, labor laws, price supports, quotas, and the countless other barriers that seem to be governments' chief products? Will the mega-corporations really be the ones that gain?

The mega-corporations, as economic-political entities, will NOT be made stronger by the Information Revolution. Quite the contrary, they will be defanged.

No. Because the tools used to create a symbiotic relationship between large corporations and the State will no longer be effective when turned against the entrepreneurs, the virtual corporations, and the fluid adhocracies that will thrive on the net. Cyber-organizations will know no boundaries and will keep little physical property at risk. The mega-corporations, as economic-political entities, will *not* be made stronger by the Information Revolution. Quite the contrary, they will be defanged. They will be outflanked. They will melt down in a brain drain of historic proportions as the most productive of their employees flee to pursue free-agency on the net, released from the physical constraints

that kept them bound to their jobs, while the least-productive employees will hang on for dear life, bringing their employers down with them.

But can we really disregard the economies of scale that defined the age of mass production? Will large-scale industrial production in the next century move off the center stage as agriculture did in this century? Is it possible for us all to become free agents?

Think about an industry that was defined by and is still organized according to the principles of the past — the automobile industry. Where is the real competitive value in a car? How much of that value is in raw materials, energy, and transportation and how much is in information? How much of a car could be created by distributed teams of designers, marketers, financial experts, engineers, advertisers, and salesmen operating on the net? With production specs, parts orders, customer option selections — the entire DNA of an automobile — being modemed to just-in-time job-shop factories operated in low-wage labor markets? The invisible hand is back and this time it has an attitude.

And what about economies of scale in the information industry itself? Who will build and control the information superhighway that will unleash these changes? Anyone who thinks that this revolution will be dominated by any one power, much less the Barry Diller–John Malone–Bell Atlantic–Time Warner shovel-more-at-them-and-they'll-eat-it school of marketing, is a fool. This is a bogeyman that has been created by the self-appointed advocates of the information have-nots in their efforts to create a new round of complex government dependencies and new industrial policies. The rush to protect us from the 500-channel cable monster is a ruse to justify one last desperate grasp for power. The growth of cyberspace will not and cannot be planned by any central authorities, government or corporate. It will be a spontaneously self-organizing, continuously evolving, chaotic free-for-all shaped only by the uncoerced choices of the millions of individuals that populate it. And this will make it the perfect crucible for radical capitalism.

Bill Frezza is the President of Wireless Computing Associates and Co-founder of DigitaLiberty.

Changing Lanes on the Information Superhighway

BOB SHOTWELL

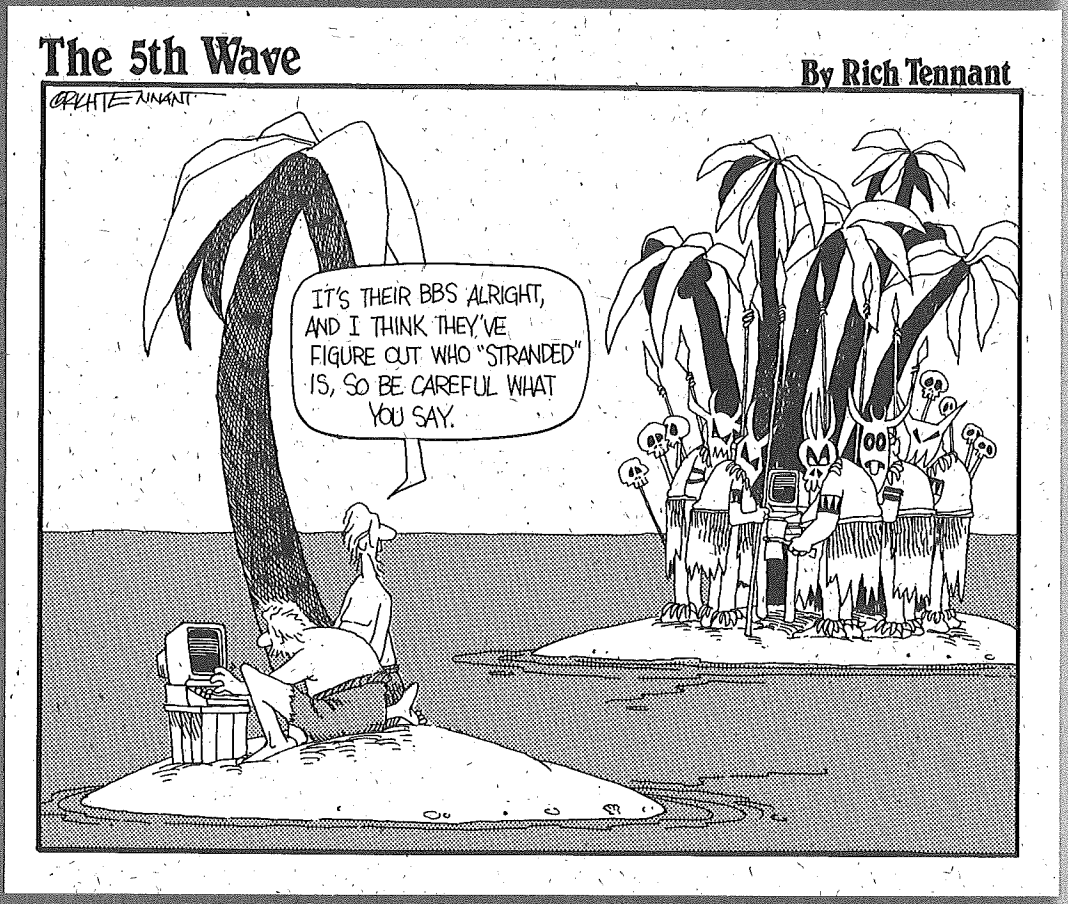
Let's accept the point that over-the-wire-information delivery will be the critical element for information delivery in the not-too-distant future. So what are we doing about changing the way software manufacturing and distribution is done today?

We believe the way to go is to provide technology and capabilities encompassing media manufacturing and distributing information globally and simultaneously so as to meet the changing needs of content creators world wide. No one wants waste, inventory, or obsolescence.

The idea is to move software in seconds worldwide electronically — our vision is to join hands with key content suppliers who will need this vision so as to convert client intellectual property to hard products anywhere in the world at the last possible moment and to be as close to the customer as possible.

Developing cost-effective information manufacturing and delivery vehicles is the way to go.

Bob Shotwell is Director of New Marketing Development of KAO Infosystems Company.



Illustrated by
RICH TENNANT

Do You Know Where Your Employees Are? (You Don't Have To)

KENNETH S. FORBES III

Labor economists say that as work-at-home options grow among corporations, the information superhighway technology that allows an employee to spend one or two days at work from a home office will grow as well.

The growing information superhighway is already making changes in the landscape of the American work force, allowing corporations to offer employees workplace options that until recently were unthinkable.

With technology that enables employees to work at home (home fax machines, modems that tie the laptop or desktop computer to corporate networks and databases, and online conferencing software packages), employees can now commute over the information superhighway, working as successfully at their home offices as in their corporate offices.

This work-at-home option is a fast-growing phenomenon, with recent studies by the Society of Human Resource Management showing that in corporations with 5,000 or more employees, 42% offered this option to selected employees — up from 11% in the late 1980s. In companies with 1,500 to 5,000 employees, 26% offered this option, up from 10% in the late 1980s. Even among companies with fewer than 100 employees, 17% offered work-at-home options, up from 9% in the late 1980s.

Labor economists say that this, as well as other workplace options, such as flextime, job sharing, and compressed work weeks, are the new job perks corporations offer highly skilled employees. These corporations are also answering the call of workers who want to combine a career with home life — a big factor now that a two-income family is more the rule than the exception.

While the technology for the information superhighway makes it easier for employees to accomplish their tasks from a home office, it has created headaches for departmental managers who must keep track of the hours these employees work from corporate offices as well as from the home.

The good news is that software innovation, such as staff scheduling, makes it possible to accomplish this type of task in a matter of seconds. Now, at the click of a button, departmental heads can track the schedule of not only when and where an employee is working but what projects that employee is doing.

Do you know where your employees are? The answer will be yes — via the new software tools and the information superhighway, which are making it possible to manage your remote workforce.

Kenneth S. Forbes III is President and CEO of Adaptive Software, Inc.

Publishing Will Take the Driver's Seat

BILL GLADSTONE

As one of the few "pure publishing" attendees of Agenda, I am somewhat biased in thinking that publishing will be the primary intellectual force guiding the development of content to be distributed and purchased on the so-called information highway. I further anticipate that publishing will be the best framework for crafting the types of contracts that will be used to pay content providers and copyright holders.

When it comes to shaping the user interface, I think the primary models will come from traditional computer software companies. The video game industry will contribute by providing product that will motivate users to get on board and generate the revenues necessary to kick-start other services. Television/Hollywood will have a role in providing both content and the delivery screen of choice. The telecommunications industry will provide the funding and will eventually reap the biggest bucks until the government over-regulates and controls profit.

Long term, publishing will be the driving force. Of course, there is going to be a single mega-company that will have divisions working in all of these industries simultaneously, and smaller conglomerates will have to form strategic alliances to compete. In the end, the key will be content — because consumers are going to have to pay for all of this, and they won't unless they get productivity tools, entertainment, or educational products that motivate them. Of almost equal importance is going to be a low price and an effortless user interface that is as easy as turning on a TV. Though computer companies may have started this highway, the industry's role is relatively limited in the long term and not nearly as important as Agenda's core attendees would wish. Individual creative artists, including writers and programming wizards, may benefit more than the conglomerates that initially fund and develop the highway. To an author's agent this seems entirely appropriate.

Bill Gladstone is President of Waterside Productions, Inc.

Driving through Autospace along the Transportation Highway

BOB METCALFE

The champion of the Iway, Vice President Albert Gore, Jr., knows the importance of The Vision Thing. So, he doesn't just say that various networking technologies are now on the verge of giving our quality of life its next major boost.

Gore doesn't just ask that the obstacle course of anachronistic federal regulations — as if there is any other kind — be cleared for these new technologies. He doesn't just say that, with a little attention to standards, these technologies will soon be ready for infrastructure-scale (read "trillion-dollar") investments — investments that he doesn't just ask us to make. He doesn't just list the many of society's problems that will be better solved when these various networking infrastructures are in place.

And Gore certainly doesn't just say, Far out, like wow, how totally mind expanding, how totally crucial to the future of democracy (if it weren't for eavesdropping fascists), and how totally excellent cruising Cyberspace can be, if you just wouldn't be so obsessed about outmoded things like money.

But, what Gore *does* say is approximately all of these things but wrapped in a metaphor — The Information Superhighway — and we've got to hand it to him (because it's a powerful metaphor?).

Make no mistake, metaphors are powerful tools. Ethernet grew out of a network analogy with the Santa Monica Freeway, which slows down with increasing traffic, hence the unfortunate term *collisions*. If you want to have ideas about something, make metaphors with it, and then milk them utterly.

So, I've started looking for good networking ideas by milking Gore's Iway metaphor. Actually, it was Robyn, my wife, who started, by filling two cars with our two kids, two dogs, our bags, and me. And we drove from our old home in California to our new home in Maine. Or, to put it another way, we went out cruising through Autospace along The Transportation Superhighway, or Tway for short. We set cruise control at 65 miles per hour and took the northern route, 3,525 miles along Interstates 280, 80, 90, and 95. We took nine days, staying overnight in Reno, Nevada; Wendover, Utah; Rawlins, Wyoming; Kearney, Nebraska; Newton, Iowa; Elkhart, Indiana; Buffalo, New York (with a detour to Niagara Falls); Utica, New York; and Boston, Massachusetts.

The first thing we noticed about the Tway is that when we turned up the on-ramp from our local-area road to the wide-area interstate, instead of slowing down by a factor of a hundred to half a mile per hour, as the Tway analogy would predict, we sped up by a factor of

two. Well, all analogies have their limits.

The second thing we noticed about the Tway is that it is completely free — serving transportation haves and have-nots alike — if you don't count the costs of our cars, their insurance, tolls, gasoline, food, hotels, and all the doodads we had to buy our kids to keep them from going bananas in the many rest stops scattered between the Purple Mountain Majesties and Amber Waves of Grain.

Actually, we paid quite a lot for these Tway amenities, all of which included substantial taxes to federal, state, and local governments. Well, fine, what better way to pay for the Tway than by charging those who use it according to their use?

The only time I resented this usage-based payment method for the Tway was while passing through that narrow strip of coastal New Hampshire that separates the rest of America from Maine. The Live-Free-or-Die state should be ashamed of itself for exploiting that narrow strip with a toll larger than that for all of I80 through California, Nevada, Utah, Wyoming, Nebraska, Iowa, Illinois, and Ohio. And it's not the rip-off toll I minded so much as the delay, sitting in lines of toll-booth traffic beneath a New Hampshire state store selling booze and lottery tickets.

There were two other big surprises along the Tway: trucks and trains, mostly side by side, as if daily demonstrating their competition. The trains were carrying a lot of truck trailers, and the trucks, some of them with 34 wheels, started looking a lot like trains. Which made me wonder why we have both.

And finally the hotels. Having lived in the Internet version of Cyberspace along the Iway for maybe 25 years, I was expecting the Tway's overnight accommodations to be run by the U.S. Hotel Service. I pictured them adjoining roadside post offices, staffed by volunteers who got their jobs years ago for any reason except enthusiasm for serving customers, and who keep their jobs through seniority.

Instead, in each town, there were many hotels to choose from, each operated by people who seemed to think that if they treated you well you might come back, or tell a friend, or get their rating boosted in the AAA guides. And, funny thing, this entrepreneurial enthusiasm, which made our stops great fun, increased as we drove further from the coasts, and decreased as we approached cities, especially Washington D.C., which fortunately is not on the way to Maine.

So, having just cruised Autospace along the Transportation Superhighway, I see that Gore's Iway metaphor works. Milking the Iway metaphor is likely to yield a lot of good ideas for how to develop and exploit national information infrastructure.

Max, my five-year-old son, was keen on counting the many motorcycles that passed us on the Interstate. They come in many forms, some resembling 34-wheelers. Many motorcyclists wear more black than necessary, especially in the hot summer sun. They must be the punks of Autospace, civil libertarians every one, wind blowing through their helmetless hair, organ donors on wheels, but still the envy of anybody heavy with responsibilities, driving, say, a Volvo station wagon like mine. They made me want to slip behind an old Next cube and rumble out onto the open fiber.

Bob Metcalfe is President and CEO of InfoWorld Publishing Company.

AGENDA

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